Appl. No. 09/825,607
Amdt. dated January 9, 2004
Reply to Office Action of September 9, 2003

PATENT

REMARKS/ARGUMENTS

Claims 1-12 are pending. Claims 1-8, 10 have been amended. Claim 9 has been canceled. Claims 11 and 12 have been added. No new matter has been added.

The title of the invention was objected to for not being descriptive. The title of the invention has been amended.

Claims 1, 2, 5, 6, and 9 were objected to for informalities. Claims 1, 2, 5, and 6 have been amended. Claim 9 has been canceled.

The Examiner rejects claims 6-9 under 35 U.S.C. 102(b) as being anticipated by Yamamoto et al.(US 5,956,750). Claims 1-5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 5,956,750) in view of Lee et al. (6,564,219 B1). Applicants traverse the rejections above.

The claimed invention relates to an information processing system that reallocates a logical storage region according to the instructions from a host computer to a storage system. The storage system has a plurality of physical storage devices (p. 9, lines 12 -14).

The host computer includes a mapping information (see Fig. 1, LV-PV mapping information 141; Figs. 3 and 4) between logical storage regions and physical storage regions for the disk devices of the storage system. When the host computer determines a logical storage region, the host computer can identify the physical storage region(s) corresponding to the logical storage region by referring to the mapping information (p. 9, lines 24-25).

To reallocate a logical storage region, the host computer determines a logical storage region, the physical storage region(s) ("first physical storage regions") corresponding to the determined logical storage region, and at least another physical storage region ("second physical storage region") to which data is to be transferred from the first physical storage regions. Then, the host computer instructs the storage system to transfer the data from the first or source physical storage region(s) to the second or destination physical storage region (Fig. 6, steps 602-604). The storage system transfers the data from the first physical storage regions to the second physical storage region upon receiving the transfer instruction from the host computer. (Fig. 7, step 702; Fig. 8).

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Yamamoto et al. discloses a logical volume reallocation in accordance with access characteristics of a logical volume. In Yamamoto, the storage system has the mapping information between the logical device and physical device (see Fig. 1). The reallocation of logical device is executed in the storage system without the cooperation of a host computer (col.1, lines 19-24). Lee et al. discloses a host computer including the mapping information between logical objects and physical space (col.8, lines 61-63; col. 8 line 66 to col. 9 line 12).

In the claimed invention, each of the independent claims (claims 1, 6, 10, and 12) recites a host computer including mapping information. The host computer specifies source physical storage regions, which correspond to a logical storage region to be reallocated, and a destination physical storage region by referring to the mapping information. The storage system executes the data transfer process from the source physical storage regions to the destination physical storage region, where both of the source physical storage regions and the destination physical storage region are designated by the instruction(s) from the host computer. Neither Yamamoto et al. nor Lee et al. discloses the above features. That is, they do not disclose the cooperative reallocation process between the host computer and the storage system comprising a plurality of physical storage devices.

One advantage of the above features of the claimed invention is that a logical volume that is not managed by the storage system can still be reallocated to another physical storage region, whereas the storage system of Yamamoto can only reallocate a logical device to another physical device if the logical device is directly managed by the storage system.

In addition, at least in the claimed invention of claims 1, 6, and 10, the host computer issues a transfer operation request for each of physical storage regions corresponding to the determined logical storage region. This is possible because rather than managing the physical storage regions as a single logical volume, the storage system regards them as a plurality of storage regions. None of the cited references discloses or suggests the above features of the claimed invention. Therefore, claims 1, 6, and 10 are allowable at least for this reasons. Claims 2-5, 7, and 8 depend from one of the above claims. Claim 9 has been canceled.

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CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

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